XXXI. *Some Account of the preparatory States of* Bombyx (Actias) Selene *of India. By* Capt. Thomas Hutton, (*in a Letter addressed to J. O. Westwood, Esq.*)

[Read 6th May, 1844.]

The first specimen of this splendid moth was brought to me on the 13th April, 1842, by a boy who had captured it in a deep and warmly-sheltered glen at Mussooree. The specimen was a female, and was found clinging to the branches of a tree, or rather shrub, very similar to the Tartarian honeysuckle; it was accompanied by a male (in coitu), which effected its escape. As the specimen was much injured by her rough captor, I suffered her to live and deposit her eggs, which she did on the evening of the same day, to the number of 32, each being of the size of a large mustard seed, and of a mottled brownish colour. During the whole of the succeeding day she remained perfectly stationary, clinging to the window frame, but in the evening deposited 84 eggs, and on the following evenings she again deposited as follows: on the 15th, 38 eggs; on the 16th, 21 eggs; on the 17th, 16 eggs; on the 18th, 21 eggs; on the 19th, 14 eggs; on the 20th, 14 eggs; and on the 21st, 7 eggs, amounting in all to 246 eggs, and she then died.

On the 28th April I received a male and female from the same place, and in the evening the female deposited 89 eggs; and continued each night to increase the number until she had deposited 300 eggs, when she died.

On the 30th April, or eighteen days from the time of deposition, the first batch of eggs began to hatch; the newly born caterpillar is about three lines in length, hairy, and of a pale rufous red, with a single black band across the middle of the body, and a small black transverse mark on the anterior segment; along the back are two rows of small tubercles, and another along each side, from each of which spring a few short hairs, the base of which forms a small black dot; there is also an anal tubercle, larger than the others, and placed between the two last tubercles of the dorsal rows; the head is black.

I was now exceedingly puzzled to find out the proper food, and having unsuccessfully tried several kinds, at last gave them the leaves of our common hill oak (an Ilex), of which they ate sparingly and without appetite. This was evidently not the proper food; and although they continued to eat it they did not thrive, but died in such numbers that I had at last only five caterpillars left out of 546, and even these I was in daily expectation of losing, when by

a lucky chance, on the 30th of June, I discovered a single caterpillar in the forest feeding on a tree known to the natives as the "*Munsooree*."

Branches of this tree were now substituted for the oak, and from thenceforward the caterpillars ate greedily, and increased rapidly in size.

The first moult commenced when six days old, and this occupied three days, so that at the end of nine days the caterpillar appeared in its second stage. The black transverse band upon the body had disappeared, but the head still remained of that colour, and the rest of the body was hairy and rufous; the tubercles being black on the summit, and more prominent; prolegs brown.

The period between each change was about ten days in some specimens, but varied in others between that and shorter periods, probably depending in a great measure upon the quantity of nourishment obtained from the branches with which they were daily supplied.

In the third stage the caterpillar appeared of a bright rufous colour; the black dots or tubercles being larger and more prominent, but there were no black bands.

In the fourth stage the change was still more remarkable, for the caterpillar now appeared of a beautiful pale apple green, each tubercle headed with bright orange, except the four which spring from the second and third segments, which are ringed with black, and crowned with pale yellow; and the *anal* and *two posterior* tubercles, which are green throughout. From each tubercle springs a small tuft of hair, the centre one of each being longer than the others; the head and prolegs brown; along each side is a line which is red above and yellow below, and the spiracles are red; there is a line of very small yellow dots along each side, between the rows of tubercles.

In the fifth stage the colours are the same, as are they also in the sixth and seventh stages, but the caterpillar increases rapidly in size, and is most beautiful and delicate in appearance, with a semi-transparency of hue, which makes it look something like wax work.

One of these commenced spinning its cocoon on the 17th of July, being then about forty-six or forty-seven days old; and the remainder after the interval of a day or two, that is, on the 19th, 20th, and 25th July, spun up also.

The cocoon is formed of coarse brown silken threads, closely interwoven, and of an ovate form; it is inclosed among the leaves of the tree, which are in fact glued closely round it. It is hard,

and not furnished interiorly with a soft silken bed, the chrysalis lying within a hard and hollow chamber.

The chrysalis remained thus until the 14th August, when the one which had turned on the 17th July produced a perfect female, after a period of twenty-nine days. Another, which had turned on the 19th July, came forth a male on the 16th August, showing the time to be pretty uniform. A large caterpillar however, which I found in the forest on the 16th July, turned to a chrysalis on the 24th of that month, but instead of coming forth in the autumn, it remained in the chrysalis state throughout the winter, as did some others; coming out in the following summer, namely, on the 11th, 14th, and 18th of June.

There would consequently appear to be great irregularity in the time of coming forth from the pupa state, and this at first led me to consider the insect double brooded. On farther consideration, however, I am inclined to abandon that opinion.

The eggs deposited by the specimens procured on the 13th and 28th of April produced perfect insects in the middle of August; but had these been permitted in their turn to deposit eggs, no caterpillar would have been hatched from them until the following spring or summer months. It was probably from such ova that the caterpillars procured in the forest on the 30th June and 16th July had been produced, while the moths captured in the middle of April had come forth from pupæ which had survived through the winter in that state; the species is thus seen to be only single brooded, although the larvæ are found throughout the year.

The caterpillar feeds upon several trees common on these hills, and among others the walnut has been mentioned to me. The most common food appears to be the Munsooree, a shrub which is so common as to have given rise, I believe, to the name of this settlement, viz. "Munsoory," or more commonly among Europeans, "Mussooree." I do not know the botanical name of this shrub, but doubtless both Dr. Royle and Falconer will make you acquainted with it.

Note.—Capt. Hutton proceeds to notice the mode by which it appeared to him that the moth makes its escape from the cocoon, as noticed in the Journal of Proceedings of the 6th May, 1844, which it has not however been considered advisable to publish further in detail, until fresh observations promised by the author have been received.